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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,975	10/19/2005	Young Kyu Son	3449-0545PUS1	8239
2292 7590 04/29/2010 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER MOK, ALEX W				
ART UNIT 2834		PAPER NUMBER		
NOTIFICATION DATE 04/29/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

### Office Action Summary

**Application No.**

10/553,975

**Applicant(s)**

SON ET AL.

**Examiner**

ALEX W. MOK

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 40-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 40-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/300)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 3/30/10, 3/31/10

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 3/30/10 and 3/31/10 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 40-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki (US Patent No.: 6166889).

For claim 40, Aoki discloses a stepping motor comprising a bracket (figure 8, reference numeral 3) including a first supporting unit (reference numerals 2, 3a, figure 6) and a third supporting unit (reference numerals 3, 3c, figure 6); a housing (reference numeral 3, see figure 6) including a first portion coupled to the third supporting unit (see figure 6, figure 3), a second portion connected to the first portion (figure 6), and a third

portion integrally formed on the second portion (figure 6); a stator (reference numerals 13, 14) including a first stator faced with the first portion of the housing and a second stator faced with the second portion of the housing (see figures 5, 6), wherein the stator is disposed in the housing to form an electric field; a magnet (reference numeral 11) faced with the stator and configured to provide a magnetic field (figures 5, 6); a shaft having a lead screw (reference numeral 1) and rotating with the magnet, wherein the shaft is rotatably supported by the first supporting unit (see figure 5); a second supporting unit (reference numeral 31a) disposed in the third portion of the housing (figures 5, 6); and a stopper (reference numeral 31) coupled to the third portion of the housing and configured to elastically support the shaft together with the second supporting unit and to prevent the second supporting unit from being removed out from the third portion of the housing (see figure 6), wherein an inner surface of the stopper is contacted with an outer surface of the third portion of the housing (see figure 5).

For claim 41, Aoki discloses the second portion of the housing being integrally formed on the first portion of the housing (reference numeral 3, see figure 6).

For claim 42, Aoki discloses the third supporting unit including a hooking part formed by bending the bracket (see figure 8).

For claim 43, Aoki discloses the third supporting unit including a supporting member coupled to the hooking part (reference numeral 4, figures 6, 8).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent No.: 6166889) in view of Yang (Korean Patent Document No.: KR 10-2002-0019331).

For claim 44, Aoki discloses the claimed invention except for the magnet including a first magnet faced with the first stator and a second magnet faced with the second stator, and wherein the first magnet and the second magnet are spaced from each other. Yang discloses a first and second magnet (reference numeral 156) facing the first and second stator, and the first and second magnets spaced from each other (see figure 4). It would have been obvious to have these magnets of Yang in the invention of Aoki, since Yang uses this configuration for a stepping motor (see Abstract), and a person of ordinary skill would have been able to include this technique for particular design of the motor.

For claim 45, Aoki discloses the claimed invention except for the second supporting unit including a ball contacting an end of the shaft and a thrust bearing contacting the ball. Yang discloses the second supporting unit having a ball (reference numeral 140) contacting the shaft and a thrust bearing (reference numeral 184) contacting the ball (see figure 4), and it would have been obvious to include the ball and

bearing of Yang in the invention of Aoki since Yang uses this configuration for supporting the shaft and having proper operation of the motor.

For claim 46, Aoki discloses the claimed invention except for the second supporting unit including a spring contacting the thrust bearing. Yang discloses a spring (reference numeral 160, figure 4) contacting the thrust bearing, and it would have been obvious to include this spring configuration in the invention of Aoki since Yang uses this technique for axially supporting the bearing configuration and absorbing the impact from the shaft (see figure 4).

6. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent No.: 6166889) in view of Mayumi (US Patent No.: 6541886).

For claim 47, Aoki discloses the claimed invention except for the stopper including an inclined inner surface faced with the outer surface of the third portion of the housing. Mayumi discloses a similar stopper portion (reference numeral 43) having an inclined inner surface facing a cap member (see figure 1), and it would have been obvious to include this inclined surface as taught by Mayumi in the invention of Aoki so that it faces the outer surface of the housing, as this configuration would further secure the components of the motor during assembly.

7. Claims 48-51, 55-59, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent No.: 6166889) in view of Ando (Japanese Patent Document No.: JP 07015939 A) and Mayumi (US Patent No.: 6541886).

For claim 48, Aoki discloses the claimed invention comprising a bracket (figure 8, reference numeral 3) including a first supporting unit (reference numerals 2, 3a, figure 6) and a third supporting unit (reference numerals 3, 3c, figure 6); a housing (reference numeral 3, see figure 6) including a first portion coupled to the third supporting unit (see figure 6, figure 3), a second portion connected to the first portion (figure 6), and a third portion integrally formed on the second portion (figure 6); a stator (reference numerals 13, 14) including a first stator faced with the first portion of the housing and a second stator faced with the second portion of the housing (see figures 5, 6), wherein the stator is disposed in the housing to form an electric field; a magnet (reference numeral 11) faced with the stator and configured to provide a magnetic field (figures 5, 6); a shaft having a lead screw (reference numeral 1) and rotating with the magnet, wherein the shaft is rotatably supported by the first supporting unit (see figure 5); a second supporting unit (reference numeral 31a) disposed in the third portion of the housing (figures 5, 6); and a stopper (reference numeral 31) coupled to the third portion of the housing and configured to support the shaft together with the second supporting unit and to prevent the second supporting unit from being removed out from the third portion of the housing (see figure 6). Aoki however does not specifically disclose the second portion of the housing having a first section, and the third portion of the housing having a second section smaller than the first section; or the second supporting unit, the third portion of the housing, and the stopper being overlapped in a plane perpendicular to an axis direction of the shaft.

Ando discloses a bearing (reference numeral 8, figure 4), i.e. second supporting unit, and a bottom portion of the housing (reference numeral 3, see figure 4) being smaller than the remaining portion of the housing, and Mayumi discloses a similar stopper portion (reference numeral 43, figure 1) surrounding a portion of the motor that is smaller than the rest of the housing (reference numeral 28, figure 1).

It would have been obvious to apply the stopper component of Mayumi to the smaller housing portion of Ando so that the stopper component of Mayumi along with the bearing and housing component of Ando would overlap in a plane perpendicular to an axis direction of the shaft and incorporate this configuration to Aoki, since the inventions of Ando and Mayumi are related to improving the efficiency of the stepping motors, and a person of ordinary skill would have been able to apply this particular configuration for the purpose of simplifying the assembly of the motor device.

For claim 49, Aoki discloses the second portion of the housing being integrally formed on the first portion of the housing (reference numeral 3, see figure 6).

For claim 50, Aoki discloses the third supporting unit including a hooking part formed by bending the bracket (see figure 8).

For claim 51, Aoki discloses the third supporting unit including a supporting member coupled to the hooking part (reference numeral 4, figures 6, 8).

For claim 55, Aoki in view of Ando and Mayumi disclose the claimed invention except for the stopper including an inclined inner surface faced with the outer surface of the third portion of the housing. Mayumi discloses a similar stopper portion (reference numeral 43) having an inclined inner surface facing a cap member (see figure 1), and it



would have been obvious to include this inclined surface as taught by Mayumi in the inventions of Aoki and Ando so that it faces the outer surface of the housing, as this configuration would further secure the components of the motor during assembly.

For claim 56, Aoki discloses the claimed invention comprising a bracket (figure 8, reference numeral 3) including a first supporting unit (reference numerals 2, 3a, figure 6) and a third supporting unit (reference numerals 3, 3c, figure 6); a housing (reference numeral 3, see figure 6) including a first portion coupled to the third supporting unit (see figure 6, figure 3), a second portion connected to the first portion (figure 6), and a third portion integrally formed on the second portion (figure 6), a stator (reference numerals 13, 14) including a first stator faced with the first portion of the housing and a second stator faced with the second portion of the housing (see figures 5, 6), wherein the stator is disposed in the housing to form an electric field; a magnet (reference numeral 11) faced with the stator and configured to provide a magnetic field (figures 5, 6); a shaft having a lead screw (reference numeral 1) and rotating with the magnet, wherein the shaft is rotatably supported by the first supporting unit (see figure 5); a second supporting unit (reference numeral 31a) disposed in the third portion of the housing (figures 5, 6); and a stopper (reference numeral 31) coupled to the third portion of the housing and configured to rotatably support the shaft together with the second supporting unit and to prevent the second supporting unit from being removed out from the third portion of the housing (see figure 6). Aoki also teaches a second portion of the stopper contacting an outer surface of the third portion of the housing (see figure 5), but does not specifically disclose the second portion of the housing having a first section,

and the third portion of the housing having a second section smaller than the first section; the second section of the third portion of the housing being as large as the second supporting unit can be inserted and installed at the third portion of the housing, and a first portion of the stopper being contacted with a side surface of the third portion of the housing.

Ando discloses a bearing (reference numeral 8, figure 4), i.e. second supporting unit, and a bottom portion of the housing (reference numeral 3, see figure 4) being smaller than the remaining portion of the housing, which also constitutes the second supporting unit being installed at the third portion of the housing, and Mayumi discloses a similar stopper portion (reference numeral 43, figure 1) surrounding a portion of the motor that is smaller than the rest of the housing (reference numeral 28, figure 1), and also contacting a side surface of the cap portion (reference numeral 25, figure 1).

It would have been obvious to include the stopper component of Mayumi to the smaller housing portion of Ando so that the stopper would also be in contact with the side surface of the smaller housing portion and have the second supporting unit be installed at this portion of the housing and apply it to Aoki, since the inventions of Ando and Mayumi are related to improving the efficiency of the stepping motors, and a person of ordinary skill would have been able to apply this particular configuration for the purpose of simplifying the assembly of the motor device.

For claim 57, Aoki discloses the second portion of the housing being integrally formed on the first portion of the housing (reference numeral 3, see figure 6).

For claim 58, Aoki discloses the third supporting unit including a hooking part formed by bending the bracket (see figure 8).

For claim 59, Aoki discloses the third supporting unit including a supporting member coupled to the hooking part (reference numeral 4, figures 6, 8).

For claim 63, Aoki in view of Ando and Mayumi disclose the claimed invention except for the stopper including an inclined inner surface faced with the outer surface of the third portion of the housing. Mayumi discloses a similar stopper portion (reference numeral 43) having an inclined inner surface facing a cap member (see figure 1), and it would have been obvious to include this inclined surface as taught by Mayumi in the inventions of Aoki and Ando so that it faces the outer surface of the housing, as this configuration would further secure the components of the motor during assembly.

8. Claims 52-54 and 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki (US Patent No.: 6166889) in view of Ando (Japanese Patent Document No.: JP 07015939 A) and Mayumi (US Patent No.: 6541886) as applied to claims 48 and 56 above, and further in view of Yang (Korean Patent Document No.: KR 10-2002-0019331).

For claims 52 and 60, Aoki, Ando, and Mayumi disclose the claimed invention except for the magnet including a first magnet faced with the first stator and a second magnet faced with the second stator, and wherein the first magnet and the second magnet are spaced from each other. Yang discloses a first and second magnet (reference numeral 156) facing the first and second stator, and the first and second

magnets spaced from each other (see figure 4). It would have been obvious to have these magnets of Yang in the inventions of Aoki, Ando and Mayumi, since Yang uses this configuration for a stepping motor (see Abstract), and a person of ordinary skill would have been able to include this technique for particular design of the motor.

For claims 53 and 61, Aoki, Ando, and Mayumi disclose the claimed invention except for the second supporting unit including a ball contacting an end of the shaft and a thrust bearing contacting the ball. Yang discloses the second supporting unit having a ball (reference numeral 140) contacting the shaft and a thrust bearing (reference numeral 184) contacting the ball (see figure 4), and it would have been obvious to include the ball and bearing of Yang in the inventions of Aoki, Ando, and Mayumi since Yang uses this configuration for supporting the shaft and having proper operation of the motor.

For claims 54 and 62, Aoki, Ando, and Mayumi disclose the claimed invention except for the second supporting unit including a spring contacting the thrust bearing. Yang discloses a spring (reference numeral 160, figure 4) contacting the thrust bearing, and it would have been obvious to include this spring configuration in the inventions of Aoki, Ando, and Mayumi since Yang uses this technique for axially supporting the bearing configuration and absorbing the impact from the shaft (see figure 4).

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX W. MOK whose telephone number is (571)272-

9084. The examiner can normally be reached on 7:30-5:00 Eastern Time, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen P. Leung can be reached on (571) 272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/  
Supervisory Patent Examiner, Art Unit 2834

/A. W. M./  
Examiner, Art Unit 2834